TWIN STATE ENVIRONMENTAL CORP.
P.O. Box 719, Commercial Park, 1A Huntington Road, Richmond, VT 05477
Tel.: (802) 434-3350 • Fax: (802) 434-4478 • Email: tsefs@together.net

December 9, 1997

Mr. R.M. Vallee
c/o R.L. Vallee, Inc.
280 South Main Street
P.O. Box 192
St. Albans, Vermont 05478

RE: Initial Site Investigation
Former F.A. Richmond Ford, Woodstock, Vermont
TSEC Project # 97-071, SMS Site #NA

Dear Mr. Vallee:

Enclosed is the Site Investigation Report that was prepared under the State of Vermont Agency of Natural Resources (ANR) Site Investigation Expressway Program at the above referenced SITE. This SITE was approved to participate in the program by the ANR on July 30, 1997.

Soil and groundwater contamination was observed in the former UST excavation during tank replacement activities in June 1997. Our recent subsurface investigation in September 1997 has indicated that petroleum contamination, as a result of these former tanks and the former pump island, has impacted soil and groundwater beneath the SITE.

We have recommended a groundwater sampling program be implemented to monitor the seasonal changes in the hydrology and contaminant levels beneath the SITE. SITE conditions will be reevaluated after one (1) year, and recommendations will be made accordingly.

Please call to discuss our findings or other matters of concern.

Very truly yours,
TWIN STATE ENVIRONMENTAL CORPORATION

Jon P. Berntsen
Geologist

encl.
cc: Mr. Matthew Moran, State of Vermont, Sites Management Section

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Phase (check one)	Type (check one)
✓ Site Investigation	☐ Work Scope
☐ Corrective Action Feasibility Investigation	✓ Technical Report
☐ Corrective Action Plan	☐ PCF Reimbursement Request
☐ Corrective Action Summary Report	☐ General Correspondence
☐ Operations & Monitoring Report	

INITIAL SITE
INVESTIGATION REPORT

December 9, 1997

Former F.A. Richmond Ford
66 Pleasant Street
Woodstock, Vermont

SMS Site #N/A
UST Facility #1077
TSEC #97-031

Prepared for:
Mr. R.M. Vallee
c/o R.L. Vallee, Inc.
280 South Main Street, P.O. Box 192
St. Albans, Vermont 05478
(802) 524-8710

Written By:

Jon P. Berntsen
Geologist

Reviewed By:

John R. Diego
Vice President

1.0 INTRODUCTION

This Initial Site Investigation (ISI) Report has been prepared by Twin State Environmental Corporation (TSEC) to present the findings of environmental conditions encountered during a recent subsurface site investigation at the former F.A. Richmond Ford property located at 66 Pleasant Street in Woodstock, Vermont (SITE) (see SITE Location Map, **Figure 1**). This investigation was initiated in response to conditions encountered during the removal of three (3) on-SITE gasoline underground storage tanks (USTs).

Three (3) gasoline USTs were removed from the SITE between June 16 and 18, 1997 as part of an overall SITE upgrade. The removed USTs consisted of one (1) 4,000 gallon steel gasoline tank, and two (2) 6,000 gallon steel gasoline tanks. During the uncovering of the tanks, contaminated soil was encountered on the southern end of the excavation, proximate to old product lines (pre 1987) found buried in this area. A 500-gallon fuel oil UST was also removed from the SITE during this time.

A post-removal inspection of the USTs and associated fiberglass piping indicated that all equipment was in very good condition. Some slight surface staining, however, was noted adjacent to the pump island. Based on the contamination encountered during the tank removals, a subsurface investigation was recommended for the SITE.

2.0 SCOPE OF SERVICES

The following scope of services was performed by TSEC during this investigation:

- Four (4) borings were advanced using hollow-stem auger drilling techniques to investigate the degree and extent of soil and groundwater contamination resulting from the former USTs. Recovered soil samples were field screened using a ThermoEnvironmental Instruments Organic Vapor Meter (OVM) equipped with a 10.6 eV lamp.

- Four (4) 2-inch poly-vinyl chloride (PVC) groundwater monitoring wells were installed into these borings. The wells were developed in accordance with TSEC's standard operating procedures.

- Groundwater samples were collected from the four (4) newly installed monitoring wells, and submitted for analysis at Endyne, Inc. of Williston, Vermont by USEPA Method 8020 for VOCs and by USEPA Method 8015 M for total petroleum hydrocarbons (TPH) as gasoline.

- Elevations and locations of the four (4) on-SITE monitoring wells, the groundwater collection sump, and the stream sampling points were surveyed. The data obtained has been used to create a site map (**Figure 2**), a groundwater flow map (**Figure 3**) and contaminant distribution maps (**Figures 4, 5, and 6**).

- A survey of sensitive receptors was conducted, focusing on surface water, residential basements (if present), and private drinking water wells.

- A summary report of the above-mentioned work was prepared.

3.0 SITE LOCATION AND DESCRIPTION

SITE Owner:	R.L. Vallee, Inc.		
SITE Address:	66 Pleasant Street	**Lat:**	42.626795° North
	Woodstock, Vermont	**Long:**	72.507483° West
Legal Location:	Woodstock Lister's Map 21, Lot 39.		
Zoning:	Commercial		
Utilities:	Water - Municipal Supply		
	Sewer - Municipal		
	Electric - Underground connection		
	Telephone - Underground connection		
Structures:	One (1) single story convenience store and gasoline distribution business with full basement. Recent improvements include renovation from a former automobile distributor and gasoline retailer to a gasoline retailer and a convenience store.		

The SITE is located on the north side of Route 4, at the intersection of Hartland Hill Road, in the town of Woodstock, Vermont (see SITE Location Map, **Figure 1**). The building on-SITE is currently in use as a convenience store and retail gas station. The current USTs for the station are located to the north of the convenience store and are covered by a concrete pad (see SITE Plan, **Figure 2**). These tanks consist one (1) 12,000 gallon super unleaded tank, and one (1) 12,000 gallon regular unleaded tank. Product is transferred by pressurized underground conveyance lines to the pump islands on the north side of the SITE.

The SITE is commercially zoned and is situated in a mixed residential/commercial land use area. The properties adjacent to the SITE consist of Woodstock Chiropractic and the former Gerrish Motors to the east; a Cumberland Farms gasoline service station to the north; an abandoned service station to the south; and the Woodstock Correctional Facility to the west. An east to west flowing brook is culvertized beneath the central portion of the SITE, and exits the SITE along the northeast corner (see SITE Plan, **Figure 2**).

The topography of the southern portion of the SITE is relatively flat. The northern end of the SITE slopes gently to the west until it intersects a steep slope leading down to the brook. The nearest surface water, and potential sensitive receptor is the brook which runs through the SITE. This brook ultimately discharges into the Ottauquechee River at a distance of <100 ft.

4.0 UST CLOSURES ON SITE

Three (3) gasoline USTs and one fuel oil UST were removed from the SITE between June 16 and 18, 1997. Tank removal oversight was provided by TSEC. The gasoline tanks and associated piping, reportedly installed in 1987, were all reported to be in very good condition. The 40 year old fuel oil UST was reported to be in good condition.

During the uncovering of the USTs, soils screened at the south end of the tank cavity by photoionization detector (PID) headspace methods showed concentrations as high as 709 parts per million volume (ppmv). Abandoned product lines were found buried in this area. These lines were present from the tanks removed prior to 1987. Other PID readings above the USTs (approximately 3-4 ft below ground surface [bgs]) ranged from less than 1 to 41 ppmv. PID readings measured at a depth equal to the bottom of the tank cavity ranged from 1.8 to 582 ppmv at approximately 12-13 ft bgs. Groundwater was encountered at the bottom of the tank cavity at about 13 ft bgs. No free product was observed during the excavation. Evidence of soil staining was noted on the south end of the tank cavity, and soils near the ground surface adjacent to the pump dispensers showed signs of staining.

The excavation of the three (3) gasoline USTs measured approximately 30 feet by 30 feet. Due to the fact that the east ends of the tanks were adjacent to the road (Route 4) the cavity was immediately back filled following the removal of each tank from the ground to prevent side wall caving and undermining of the road.

Based on observations made during tank closure activities, TSEC recommended performing additional work in order to characterize the SITE and determine the degree and extent of contamination. The results of this investigation are presented below.

5.0 SUBSURFACE EXPLORATION AND RESULTS

The subsurface exploration program was developed to gather data to provide a better understanding of the hydrogeology and contaminant distribution on SITE.

5.1 Advancement of Soil Borings

Four (4) soil borings were advanced by Capital Environmental Drilling Services, Inc. (CEDSI) under the direction of TSEC in locations indicated on **Figure 2**. Logs for these borings are presented in **Appendix A**. These borings were advanced to depths ranging from 15 to 32 feet bgs. All borings were logged, describing soil strata conditions, and field analyzed with a PID using conventional headspace techniques.

General soil conditions encountered at the SITE consisted of sandy fill material overlying silty sand and gravel with little clay. Tight silt was encountered at the bottom of borings MW-202, MW-203, and MW-204. Groundwater was encountered between 10.5 and 25.9 ft bgs in borings MW-203 and MW-201, respectively.

Contaminated soil was encountered during the installation of all borings. A headspace analysis performed on the samples collected from the borings indicated VOCs present at concentrations ranging from <1 ppmv above 5 ft bgs in all borings, to 1,953 ppmv in MW-202 between 10 and 12 ft bgs. Contamination levels decrease at the bottom of all borings, as dense materials were encountered.

5.2 Monitor Well Installation

The four (4) above-mentioned borings were all converted into 2-inch diameter PVC monitoring wells. The wells were installed in the following locations and are depicted on the SITE Plan, **Figure 2**.

- Monitoring Well MW-201 was installed downgradient of the former UST cavity;
- MW-202 was installed downgradient of the former pump island;
- MW-203 was installed at the apparent upgradient edge of the former tank cavity; and,
- MW-204 was installed at the downgradient edge of the tank cavity.

Further construction details of the monitoring wells are presented below and in **Appendix A**: Boring Logs.

5.2.1 Monitor Well Construction

Monitoring wells were constructed using 2-in. schedule 40 PVC threaded riser pipe and 0.010 in. machine-slotted well screen. The annulus between the well screen and the borehole has been backfilled with a clean Ottawa-type filter sand, extending approximately 1 to 2 ft above the screened zone. About 1 to 2 ft of bentonite seal has been placed above the sand pack to hydraulically isolate the lower screened zone. The

remainder of the annulus was backfilled with clean sand or uncontaminated test boring cuttings to approximately 1 ft bgs.

A flush-mounted, water-tight curb box was set in concrete to protect the monitoring well. Each monitoring well has been fitted with an expansion plug to avoid surface infiltration to the aquifer. The depths of the wells range from 15.0 to 30.0 ft bgs.

Monitoring wells were developed to remove any fine particulates introduced into the formation during drilling and/or installation. In addition, well development was performed to hydraulically connect the aquifer and the well, allowing for more accurate determination of in situ conditions (i.e. water level, aquifer parameters, and chemical constituents).

5.3 SITE Geology

A summary of the predominate geological units encountered during drilling activities indicated a sandy fill material overlying silty sand and gravel with little clay. Refusal, a good indication of bedrock, was encountered between 17 and 32 ft bgs in borings MW-203 and MW-201 respectively. For a more detailed description of geological units, see Boring Logs, **Appendix A**.

5.4 SITE Survey

A Topcon AT-G6 auto level was used to perform a stadia survey to identify the location and elevation of the newly installed monitoring wells and brook sampling locations with respect to existing site features. The collected data was used to create the SITE Plan (**Figure 2**) which includes the location of the newly installed wells and sampling points.

6.0 COLLECTION OF GROUNDWATER SAMPLES

Groundwater sampling was performed at this SITE by TSEC on September 10, 1997. Samples were collected from the newly installed wells MW-201, MW-202, MW-203, and MW-204. The monitoring well samples were submitted to a certified laboratory for analysis by USEPA Method 8020 for VOCs and by USEPA Method 8015M for TPH. Surface water samples and sediment samples were collected from the brook that flows through the SITE. Additionally, a groundwater sample was collected from the sump recently installed at the southwest corner of the SITE building. This sample was also analyzed for VOCs and TPH.

6.1 Monitoring Well Sample Collection

Prior to sampling, depth to groundwater measurements were made in all of the wells. Depth to water ranged from 10.50 to 25.90 ft bgs at monitoring wells MW-203 and MW-201 respectively.

To allow for a representative groundwater sample, each well was purged of three (3) volumes of water with a new disposable bailer. Purge water from the wells was discharged directly to the ground surface. Sampling at each location was conducted using the bailer which was dedicated to the well.

Quality assurance/Quality control (QA/QC) samples incorporated into this sampling round included one (1) duplicate sample taken from monitor well MW-201 and one (1) field blank. The samples were analyzed via USEPA Method 8020 for VOCs. All chemical analyses for this round of groundwater sampling were performed by Endyne Inc. of Williston, Vermont. The results of the groundwater sampling round are discussed in the following sections.

6.2 Brook Sampling

Surface water and sediment samples were collected from three (3) locations. Sampling points were located as follows and are indicated on **Figure 2**, SITE Plan:

- S-1 was located across Route 4 to the east, upgradient of the SITE;
- S-2 was located at the outfall pipe, immediately downgradient of the former UST cavity; and,
- S-3 was located at the northwest corner of the property, as the brook exits the SITE.

Surface water samples were collected by direct submersion techniques, and sediment samples were collected using a decontaminated sampling device. The results of sampling are presented below.

7.0 RESULTS OF SAMPLING ACTIVITIES

7.1 Groundwater Flow Direction

Groundwater levels on SITE were measured by TSEC personnel on September 10, 1997. As previously mentioned, depth to groundwater measurements ranged from 10.50 to 25.80 ft bgs at wells MW-203 and MW-201 respectively. A full analysis of groundwater elevation data is presented in **Table 1** (Summary of Groundwater Elevations).

Based on measured depths to groundwater observed in monitoring wells on SITE at the time of sampling, groundwater underlying the SITE has been calculated to flow to the northwest in the overburden aquifer. A graphical interpretation of the groundwater elevation data is presented on the Groundwater Contour Plan provided as **Figure 3**.

According to published hydraulic conductivity values for silt and sand, the subsurface materials encountered at the SITE, the hydraulic conductivity for the aquifer ranges between 0.03 feet per day (ft/d) and 3 ft/d (Fetter, 1994). Under the measured site hydraulic gradient of 0.21 ft/ft, the calculated apparent groundwater flow velocity beneath the site ranges from 0.0063 ft/d to 0.63 ft/d.

7.2 Groundwater Analytical Results

VOC results received from Endyne indicate that petroleum affiliated compounds are present in all four (4) monitoring wells. BTEX compounds were detected in all four (4) monitoring wells sampled, however, no compounds were detected above their maximum contaminant level (MCL) as promulgated by the USEPA. Benzene is not present above its method detection limit (MDL) in any of the samples, although the MDL for monitoring wells MW-201 and MW-202 (50 micrograms per liter [µg/l]) is well above the MCL of 5 µg/l. MTBE is present above the Vermont Health Advisory (VHA) standard of 40 µg/l in monitoring well MW-201 at 614 µg/l. Duplicate results from MW-2 were also returned with MTBE above the VHA. The sample collected from the sump did not contain any detectable concentrations of any of the USEPA Method 8020 target compounds, or any detectable concentration of TPH as gasoline.

TPH values reported as gasoline range from 1,200 µg/l to 51,100 µg/l in monitoring wells MW-203 and MW-201 respectively. The presence of MTBE and elevated levels of BTEX compounds and TPH as gasoline indicate that there is contamination due to gasoline present at this SITE.

The complete analytical laboratory report from Endyne, is summarized in **Tables 2** and **3**; provided as **Attachment 1**; and graphical representations of the BTEX, MTBE, and TPH distributions across the SITE are presented as **Figures 4, 5**, and **6**.

7.2.1 QA/QC Results

The relative percent difference (RPD) was calculated for BTEX compounds present in MW-201 to be 10.17%, and the RPD for MTBE was calculated to be 6.00%. For duplicate samples, an RPD of less than 25% is generally considered acceptable.

7.3 Brook Analytical Results

The surface water and sediment samples were all returned with concentrations below their respective MDLs. The complete analytical report from Endyne is included as **Attachment 1** at the end of this report.

8.0 RECEPTOR EVALUATION

Following the removal of the USTs and the initial discovery of petroleum contamination at the SITE, a sensitive receptor evaluation was conducted in the immediate vicinity. This investigation focused on surface water receptors, groundwater supply wells, and downgradient basements.

Municipal water services the SITE and the immediate vicinity. Water lines that service the area are located approximately 5 ft above contaminated soils and are not likely impacted.

Five (5) private supply wells were identified within a ½-mile radius of the SITE, all of which are upgradient. Four (4) of these wells are completed in the bedrock aquifer at depths ranging from 85 to 172 ft bgs, and one (1) well is completed to 81 ft bgs in a gravel aquifer.

Based on the depth of the contamination, the distance to the nearest groundwater well, and the direction of groundwater flow, it does not appear that any wells in the SITE vicinity are at risk of becoming contaminated from the release.

The nearest surface water body was sampled, and does not appear to be impacted from on-SITE contamination. Additionally, the brook water surface at S-2 is approximately 7.5 ft above the measured groundwater elevation at monitoring well MW-201.

Finally, there are no basements in the immediate vicinity of the SITE other than the SITE building basement. This basement showed no obvious signs of impact. Additionally, the contamination at the downgradient edge of the SITE is approximately 25 ft below grade; below the anticipated depth of any surrounding structural features.

9.0 SUMMARY AND CONCLUSIONS

Based on the information and analytical data obtained during this investigation, TSEC concludes the following:

- The source of the contamination is believed to be the USTs that were present on-SITE prior to 1987. The USTs removed recently from the SITE were in good condition and showed no evidence of leakage or overfills. Abandoned piping associated with the pre-1987 tanks appeared to have the highest concentrations of VOCs during UST removal activities, as evidenced by PID readings.

- With groundwater contamination migrating to the northwest, away from drinking water receptors in the immediate vicinity of the SITE (½-mile), there is little threat of impact to private drinking water sources.

- With brook (surface water) elevations significantly above the groundwater table, direct impact to surface water receptors from the on-SITE contamination is unlikely.

10.0 RECOMMENDATIONS

Due to the presence of contamination in both soil and groundwater at the SITE, TSEC recommends the following:

- Based on the extent of groundwater contamination present, a groundwater monitoring program is suggested. This program would include the quarterly sampling of the four (4) on-SITE groundwater monitoring wells for a period of one (1) year. Following one (1) year of sampling and the establishment of hydrogeologic and contaminant trends, the sampling frequency should be reevaluated. If hydrogeologic trends are stable and contaminant trends are stable or decreasing, a less frequent monitoring interval may be recommended.

  The first round of samples should be analyzed via USEPA Method 8260 for VOCs. Due to the high concentrations of TPH as gasoline, and the relatively low total BTEX values, Method 8260 is recommended to determine what unidentified compounds are responsible for the discrepancy between the two analyses in groundwater. Subsequent rounds may be reduced to Method 8020.

TABLES

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS

F.A. Richmond Ford
Woodstock, Vermont

September 10, 1997

Well Identification	Top of Riser Elev.	Depth to Product	Depth to Water	Depth of Well	Thickness of Water Column	Water Table Elev.
MW-201	97.38	ND	25.90	28.50	2.60	71.48
MW-202	97.55	ND	11.00	14.50	3.50	86.55
MW-203	98.80	ND	10.50	14.40	3.90	88.30
MW-204	97.86	ND	14.50	18.90	4.40	83.36
Collection Sump	88.04	ND	0.25	NA	NA	87.79
SW-1	97.46	ND	NA	NA	NA	97.46
SW-2	78.80	ND	NA	NA	NA	78.80
SW-3	NM	ND	NA	NA	NA	NM

Notes:

1. *Elevation data are referenced to a TBM and are in units of feet.*
2. *ND - Not detected.*
3. *NA - Not applicable.*
4. *Measurements recorded are referenced to a marking on top of PVC riser for each well.*
5. *Depth to fluid measurements were obtained using chalk and tape.*

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TABLE 2

SUMMARY OF GROUNDWATER QUALITY

F.A. Richmond Ford
Woodstock, Vermont

September 10, 1997

Test	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total BTEX	MTBE	TPH as Gas
Sample ID	Concentration, ug/l						
MW-201	<50	<50	239	601	840	***614***	51,100
MW-202	<50	101	283	4,730	5,114	<100	29,600
MW-203	<1	<1	3.5	33	36.5	<2	1,200
MW-204	<5	<5	29.6	28.4	58.0	12	24,300
Collection Sump	<1	<1	<1	<2	--	<2	<100
SW-1	<1	<1	<1	<2	--	<2	<100
SW-2	<1	<1	<1	<2	--	<2	<100
SW-3	<1	<1	<1	<2	--	<2	<100
Dup-1	<50	<50	213	721	934	***652***	45,800
Field Blank	<1	<1	<1	<2	--	<2	<100
MCL	5	1,000	700	10,000	--	40 (1)	--

Notes:

MCL - Maximum Contaminant Level promulgated by USEPA.
(1) - Vermont Health Advisory (VHA) standard for MTBE.
All samples were tested using EPA Method 8020.
Bold and italic numbers indicate concentrations that exceed VGES or VHA standards.

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TABLE 3

SUMMARY OF STREAM SEDIMENT QUALITY

F.A. Richmond Ford
Woodstock, Vermont

September 10, 1997

Test	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total BTEX	MTBE	TPH as Gas
Sample ID	Concentration, ug/kg						
SS-1	<10	<10	<10	<20	--	<20	<1,000
SS-2	<10	<10	<10	<20	--	<20	<1,000
SS-3	<10	<10	<10	<20	--	<20	<1,000

Notes:
MCL - Maximum Contaminant Level promulgated by USEPA.
(1) - Vermont Health Advisory (VHA) standard for MTBE.
All samples were tested using EPA Method 8020.
Bold and italic numbers indicate concentrations that exceed VGES or VHA standards.

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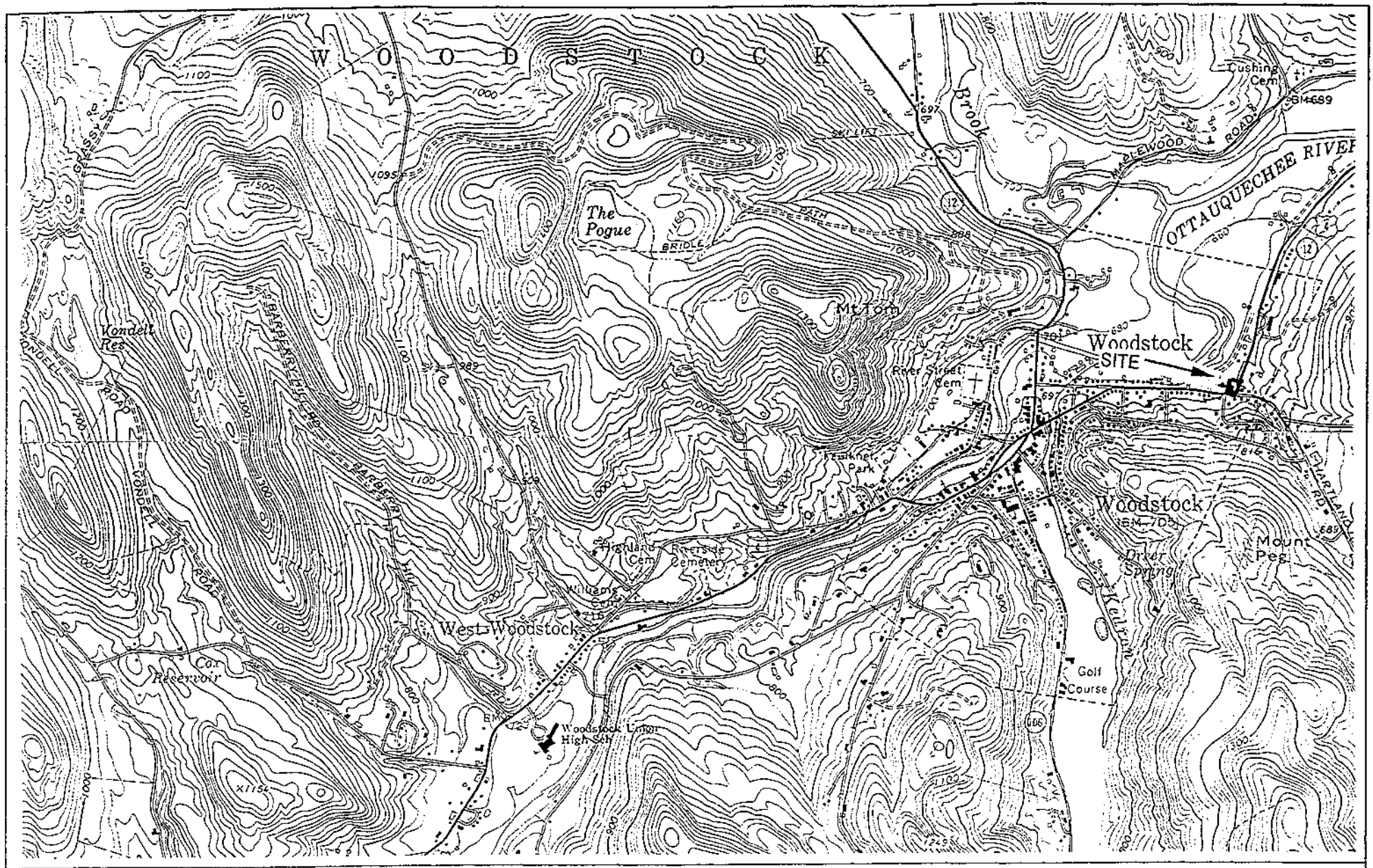
FIGURES



N

0 2000

Scale (in feet) 1"=2,000'

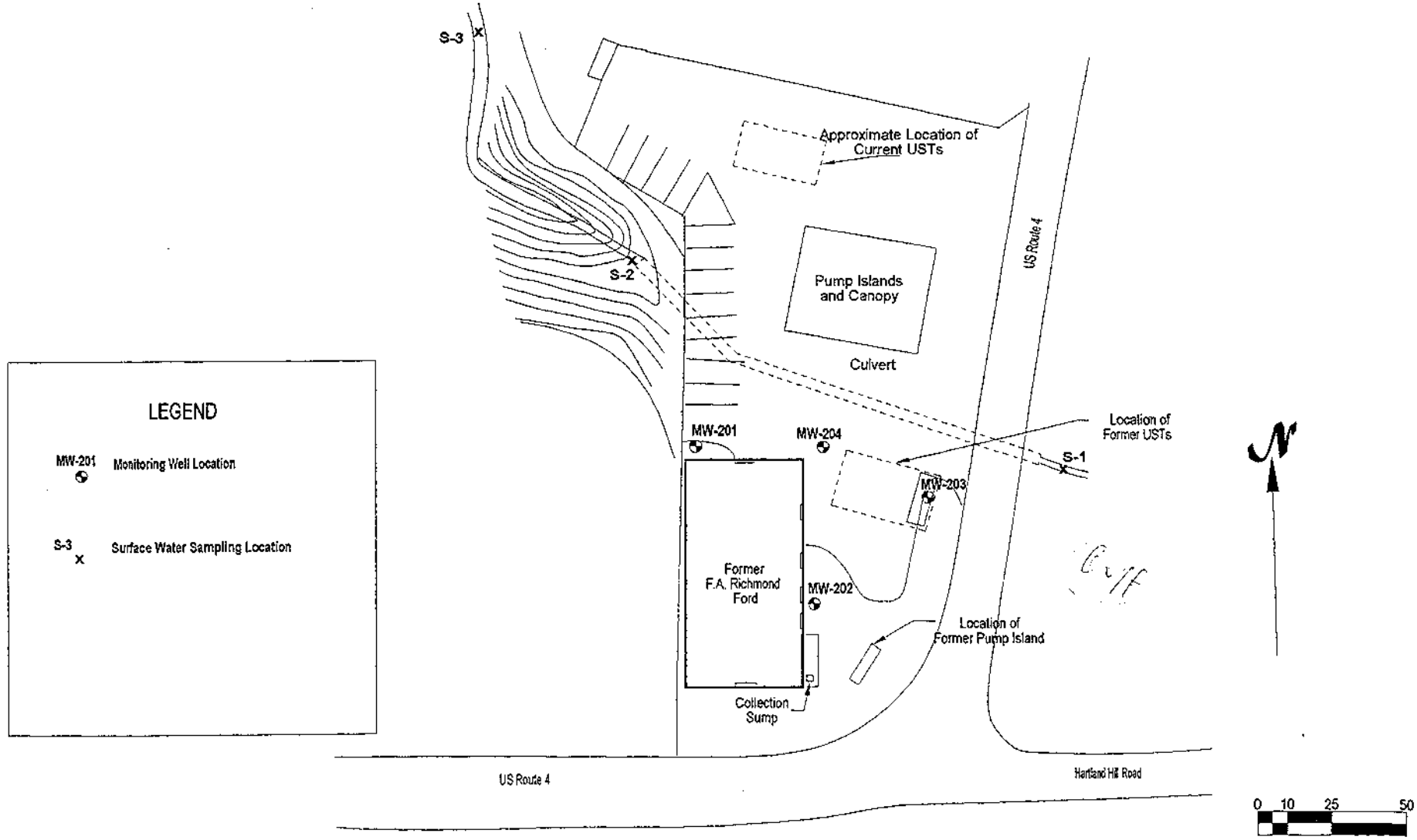
Source: USGS 7.5 Minute Topographic Series
Woodstock North and Woodstock South, Vermont Quadrangles

Project No: 97-071	
Designed By:	jpb
Checked By:	
Approved By:	
Drawn By:	jpb
Scale:	as shown
Date:	11/4/97

TWIN STATE ENVIRONMENTAL CORP.
1A Huntington Rd.
P.O. Box 719
Richmond, Vermont
(802) 434-3360

FIGURE 1
SITE LOCATION MAP

Former F.A. Richmond Ford
Woodstock, Vermont



Project No.: 97-071	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: 1"=50' Date: 10/20/97	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont 05477 (802) 434-3360	FIGURE 2 SITE PLAN Former F.A. Richmond Ford Woodstock, Vermont

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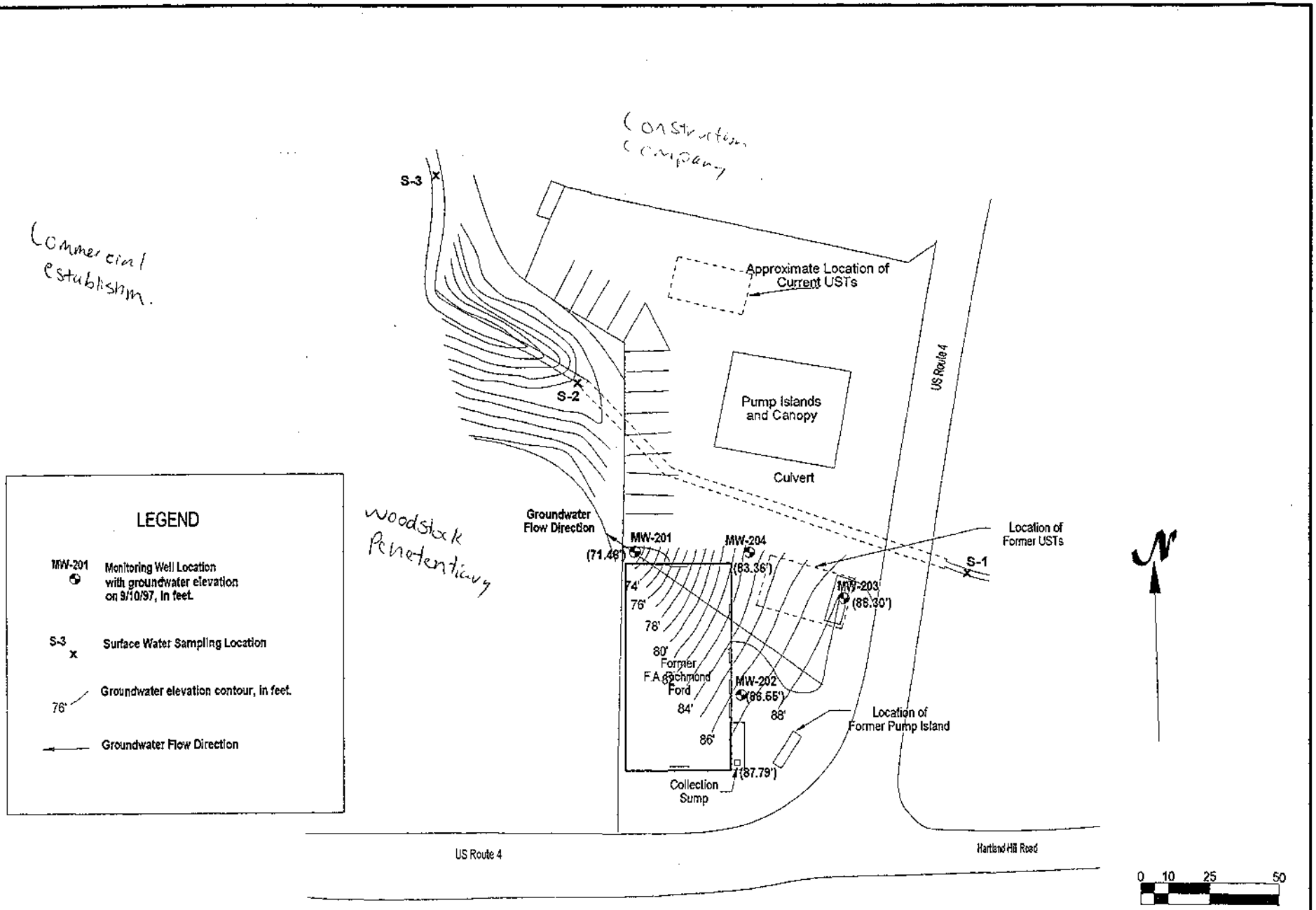

Project No.: 97-071	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: 1"=50' Date: 10/20/97	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont 05477 (802) 434-3360	FIGURE 3 GROUNDWATER CONTOUR PLAN September 10, 1997 Former F.A. Richmond Ford Woodstock, Vermont

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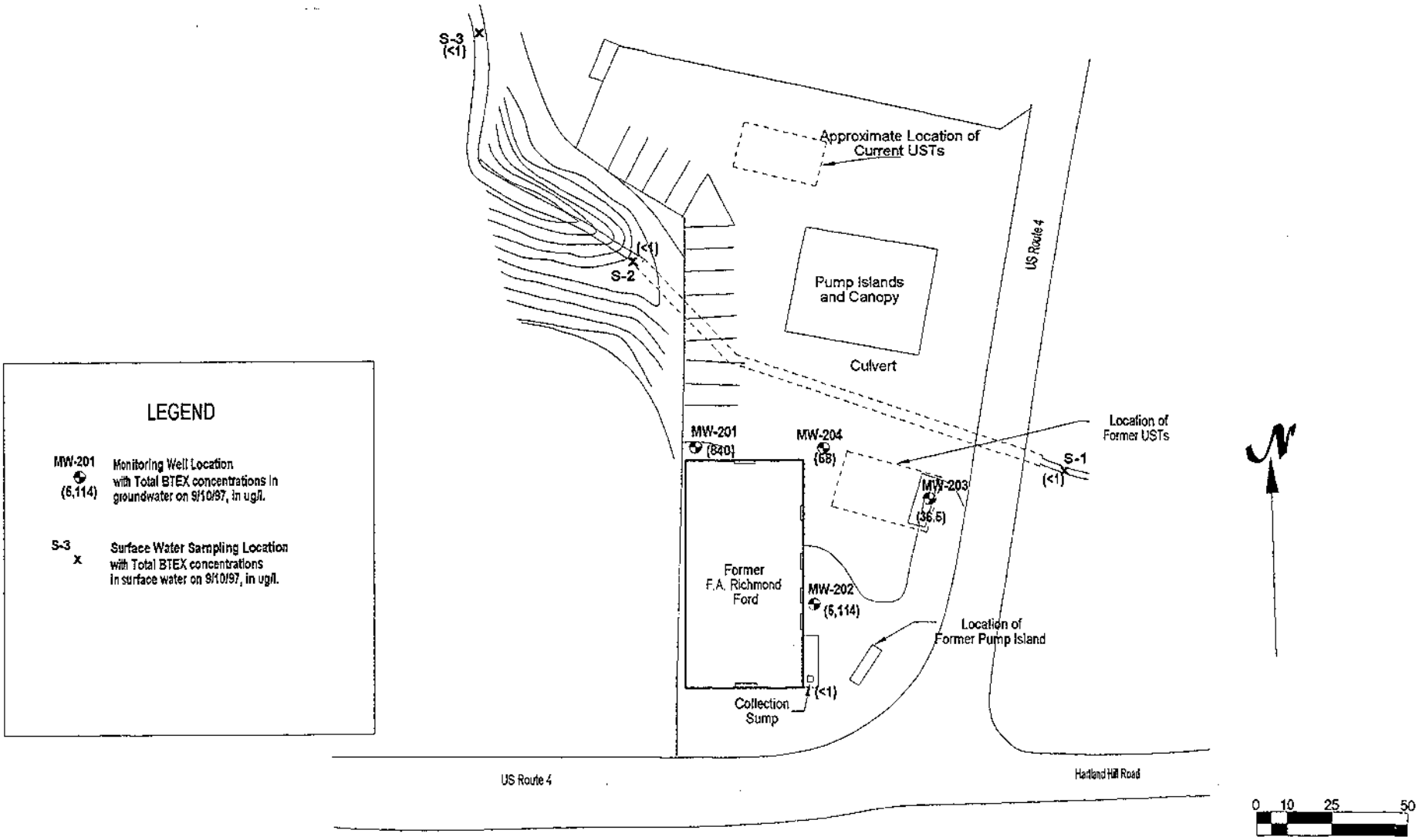

Project No.: 97-071	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: 1"=50' Date: 10/20/97	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont 05477 (802) 434-3360	FIGURE 4 BTEX DISTRIBUTION MAP September 10, 1997 Former F.A. Richmond Ford Woodstock, Vermont

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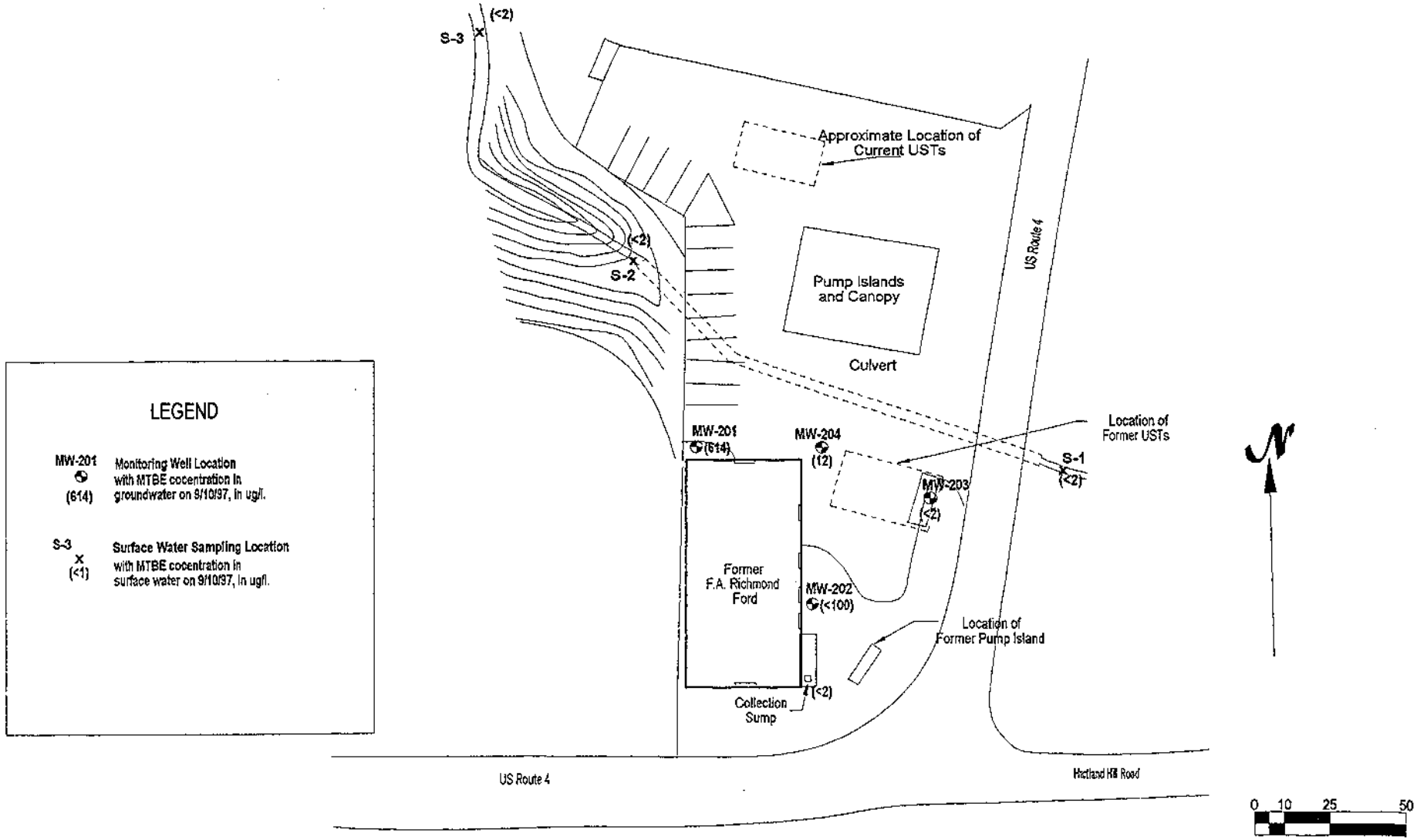

Project No.: 97-071	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: 1"=50' Date: 10/20/97	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont 05477 (802) 434-3350	FIGURE 5 MTBE DISTRIBUTION PLAN September 10, 1997 Former F.A. Richmond Ford Woodstock, Vermont

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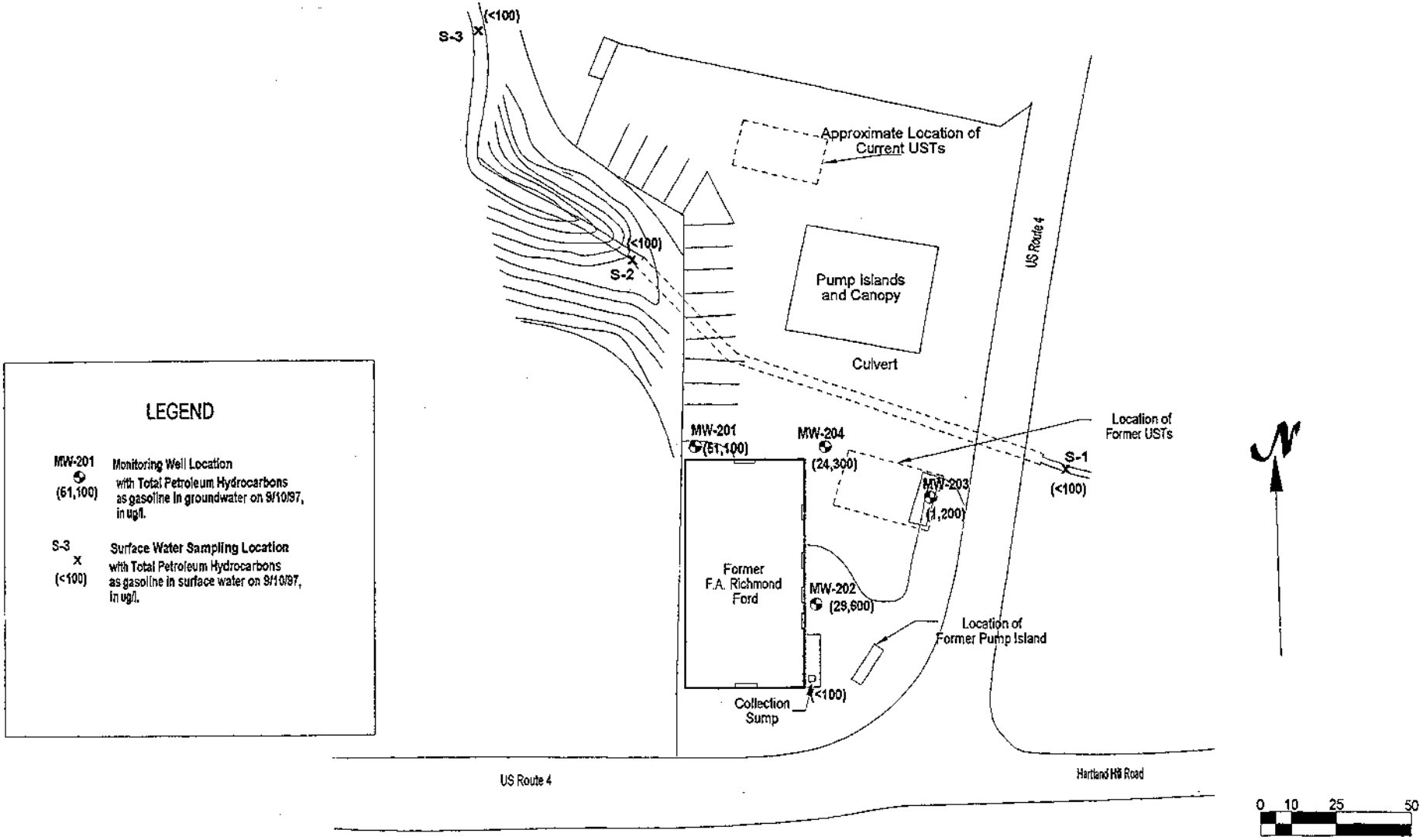

Project No.: 97-071	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: 1"=50' Date: 10/20/97	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont 05477 (802) 434-3350	FIGURE 6 TPH DISTRIBUTION PLAN September 10, 1997 Former F.A. Richmond Ford Woodstock, Vermont

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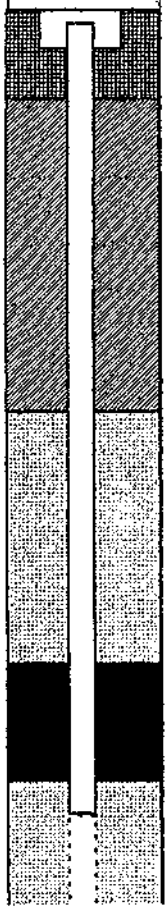
APPENDIX A

TWIN STATE ENVIRONMENTAL CORPORATION

1A Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-201	WELL DEPTH:	30.0 ft	BORING DEPTH:	32.0 ft
PROJECT NAME:	F.A. Richmond Ford	DEPTH TO WATER:	25.90 ft on 9/10/97		
PROJECT NO:	97-031	SCREEN DIA:	2-inch	DEPTH:	20.0-30.0 ft
INSTALL DATE:	September 3, 1997	SCREEN TYPE/SIZE:	Schedule 40-0.020 slot high flow		
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC		
DRILLING CO:	Capital Drilling	RISER DIA.:	2-inch	DEPTH:	0.5-20.0 ft
DRILLING METHOD:	Hollow-Stem Auger	GUARD TYPE:	Flush mounted road box set in concrete		
SAMPLING METHOD:	Split-Spoon Sampler	RISER CAP:	Expandable Gripper.		
REMARKS:	Monitoring Well MW-201 was backfilled with bentonite to 30 ft bgs. Well set from 30 to grade.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-5	<1	Auger thru fill	0.0-3.0: Fine to coarse sand and medium gravel fill. 3.0-5.0: Fine to medium sand. Dry, tan. Note: During recent construction, area was built up 10 ft ± from its original grade.
1					
2					
3					
4					
5		5-7	No reading	8-11-14-15 No recovery	Continue to auger through sand and gravel fill material
6					
7					
8					
9					
10		10-12	35.9	9-8-4-5 1.5 ft recovery	10.0-10.6: Silty fine sand. Tan, damp. 10.6-11.5: Fine to medium sand. Black/brown (oil stained).
11					
12					
13					
14					
15		15-17	49.9	49-7-4-5 1.5 ft recovery	15.0-15.25: Cemented coarse sand. Red, damp. 15.25-15.5: Fine to medium sand. Brown, dry. 15.5-15.8: Fine sand. Tan/gold, dry. 15.8-16.5: Fine to coarse sand. Dry, tan.
16					
17					
18					
19					
20		20-22	<1	10-14-20-15 1.5 ft recovery	20.0-20.25: Fine to very fine sand with trace of silt. Grey, dry. 20.25-20.5: Coarse and very coarse sand, Satrated, tan. 20.5-21.0: Fine to coarse sand with gravel. Saturated, tan
21					
22					

LEGEND

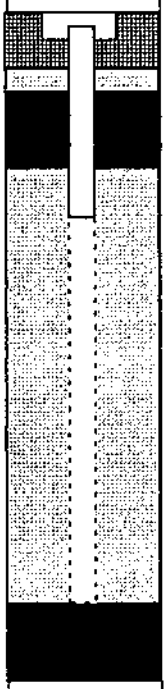
- CEMENT GROUT
- NATIVE BACKFILL
- BENTONITE SEAL
- SAND PACK
- WELL SCREEN
- RISER PIPE
- HS HEAD SPACE
- WATER LEVEL (APPROX)

TWIN STATE ENVIRONMENTAL CORPORATION

1A Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-202	WELL DEPTH: 15.0 ft	BORING DEPTH: 17.0 ft
PROJECT NAME:	F.A. Richmond Ford	DEPTH TO WATER:	11.00 ft on September 10, 1997
PROJECT NO:	97-071	SCREEN DIA: 2-inch	DEPTH: 5.0-15.0 ft bgs
INSTALL DATE:	September 3, 1997	SCREEN TYPE/SIZE:	Schedule 40 PVC - 0.010 slot
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC
DRILLING CO:	Capital Drilling	RISER DIA.: 2-inch	DEPTH: 0.5-5.0 ft bgs
DRILLING METHOD:	Hollow-Stem Auger	GUARD TYPE:	Aluminum roadbox set in concrete.
SAMPLING METHOD:	Split Spoon Sampler	RISER CAP:	Locking expansion plug.
REMARKS:	Well is located downgradient of former pump island.		

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-2	<1.0	3-4-3-2 1.5 ft recovery	0.0-0.75: Silty very fine sand. (Topsoil). Dark brown, dry. 0.75-1.5: Fine sand. Tan/brown, dry.
5		5-7	<1.0	7-6-50/1" 0.5 ft recovery	5.0-5.5: Fine sand with trace of rock fragments. 5.5-7.5: Old concrete foundation.
10		10-12	1763	12-19-13-19	10.0-11.5: Fine to coarse sand, silt, and some broken gravel. Heavy PHC odor. Saturated, tan.
11 ▼			1953	1.5 ft recovery	
15		15-17	1.8	8-22-12-13 1.5 ft recovery	15.0-15.5: Silty fine sand. Tan/grey, saturated. 15.5-16.5: Silt. Tight, grey, dry. No odor. End of Boring = 17.0 feet. End of Sampling = 17.0 feet.
25					

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:
1. See SITE Plan for exact well location.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.

TWIN STATE ENVIRONMENTAL CORPORATION

1A Huntington Road, P.O. Box 719 Richmond, Vermont 05477
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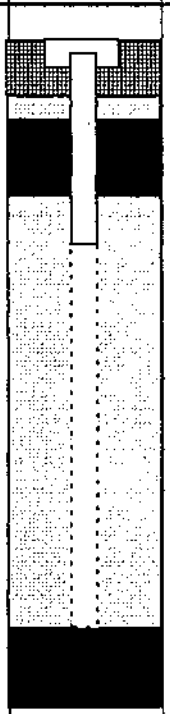
MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-203	WELL DEPTH: 15.0 ft	BORING DEPTH: 17.0 ft
PROJECT NAME:	F.A. Richmond Ford	DEPTH TO WATER:	10.50 ft on September 10, 1997
PROJECT NO:	97-071	SCREEN DIA: 2-inch	DEPTH: 5.0-15.0 ft bgs
INSTALL DATE:	September 4, 1997	SCREEN TYPE/SIZE:	Schedule 40 PVC - 0.010 slot
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC
DRILLING CO:	Capital Drilling	RISER DIA.: 2-inch	DEPTH: 0.5-5.0 ft bgs
DRILLING METHOD:	Hollow-Stem Auger	GUARD TYPE:	Aluminum roadbox set in concrete.
SAMPLING METHOD:	Split Spoon Sampler	RISER CAP:	Locking expansion plug.
REMARKS:	Well is located in the former tank cavity.		

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-5	<1.0	Auger Backfill	0.0-5.0: Sand and gravel fill material.
5		5-7	146	19-24-25-24 1.5 ft recovery	5.0-6.5: Medium and coarse sand and gravel. Tan, dry. Slight odor.
10		10-12	733	5-5-6-11 1.0 ft recovery	10.0-10.75: Coarse sand. Tan, odor. Wet at 10.5 ft. 10.75-11.0: Coarse to fine sand with trace of silt. Heavy PHC odor.
15		15-17	2.4	29-41-61-50/1" 1.5 ft recovery	15.0-15.5: Silty fine sand. Tan/grey, saturated. 15.5-16.5: Silt. Tight, grey, dry. No odor. End of Boring = 17.0 feet. End of Sampling = 17.0 feet.

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:
1. See SITE Plan for exact well location.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.

TWIN STATE ENVIRONMENTAL CORPORATION

14 Huntington Road, P.O. Box 719 Richmond, Vermont 05477
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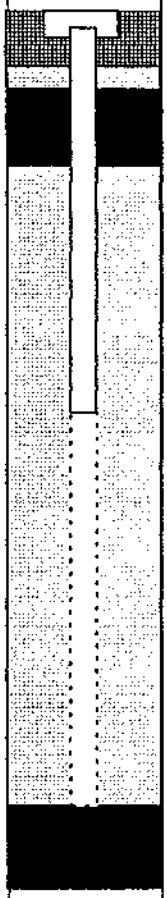
MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-204	WELL DEPTH: 20.0 ft	BORING DEPTH: 22.0 ft
PROJECT NAME:	F.A. Richmond Ford	DEPTH TO WATER:	14.50 ft on September 10, 1997
PROJECT NO:	97-071	SCREEN DIA: 2-inch	DEPTH: 10.0-20.0 ft bgs
INSTALL DATE:	September 4, 1997	SCREEN TYPE/SIZE:	Schedule 40 PVC - 0.010 slot
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC
DRILLING CO:	Capital Drilling	RISER DIA.: 2-inch	DEPTH: 0.5-10.0 ft bgs
DRILLING METHOD:	Hollow-Stem Auger	GUARD TYPE:	Aluminum roadbox set in concrete.
SAMPLING METHOD:	Split Spoon Sampler	RISER CAP:	Locking expansion plug.
REMARKS:	Well is located downgradient of the former tank cavity.		

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-5	<1.0	Auger Backfill	0.0-5.0: Sand and gravel fill material.
5		5-7	<1	14-12-13-10 0.5 ft recovery	5.0-5.5: Medium to coarse sand and gravel. Brown. From cuttings: Coarse gravel form 5-7 ft, and coarse gravel and cobbles (>4-inches) from 7 to 10 ft bgs.
10		10-12	<1	1-4-3-2 0.6 ft recovery	10.0-10.5: Coarse sand and gravel. Dry. 10.5-10.6: Layer of cemented red sand. Dry.
15		15-17	77.9 (PID from cuttings)	6-8-11-10 No recovery	From outside of spoon: Fine to medium wet sand. PHC odor.
20		20-22	662 12.0	22-68-93-79 2.0 ft recovery	20.0-22.0: Silt with trace of fine sand and gravel. Tight, grey, dry. End of Boring = 22.0 feet. End of Sampling = 22.0 feet.

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

1. See SITE Plan for exact well location.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.

ATTACHMENT 1

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

SEP 29 RECD

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F. A. Richmond 97-071.E1
DATE REPORTED: September 25, 1997
DATE SAMPLED: September 10, 1997

PROJECT CODE: TSEC1292
REF. #: 109,484 - 109,496

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated proper sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

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ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8015

DATE: September 25, 1997
CLIENT: Twin State Environmental Corp.
PROJECT: F. A. Richmond 97-071.E1
PROJECT CODE: TSEC1292
COLLECTED BY: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

Reference #	Sample ID	Concentration (mg/L)[1]
109,484	MW-201; 11:14	51.1
109,485	MW-202; 11:30	29.6
109,486	MW-203; 11:19	1.2
109,487	MW-204; 11:26	24.3
109,488	Field Blank; 11:01	ND[2]
109,489	Collection Sump; 11:02	ND
109,490	SW-1; 10:52	ND
109,491	SW-2; 12:08	ND
109,492	SW-3; 12:10	ND
109,496	Dup-1; 11:58	45.8

Notes:

1 Method detection limit is 0.1 mg/L.
2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8015

DATE: September 25, 1997
CLIENT: Twin State Environmental Corp.
PROJECT: F. A. Richmond 97-071.E1
PROJECT CODE: TSEC1292
COLLECTED BY: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

Reference #	Sample ID	Concentration (mg/kg)[1]
109,493	SS-1; 10:52	ND[2]
109,494	SS-2; 12:08	ND
109,495	SS-3; 12:10	ND

Notes:

1 Method detection limit is 1.0 mg/kg.
2 None detected

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

20980

CHAIN-OF-CUSTODY RECORD

Project Name: F.A. Richmond 97-071.E1 Site Location: WOODSTOCK, VT	Reporting Address: P.O. Box 719 Richmond, VT 05477	Billing Address: SAME
Endyne Project Number: TSEC1292	Company: TSEC Contact Name/Phone #: Jon Bernstein 434-3350	Sampler Name: BW + RL Phone #: 434-3350

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
109,484	MW-201	AQ	✓		9/10/97 1114	2	40mL VOA		Volatiles Pesticides 8015	HCL+ICE	NO
109,485	MW-202				1130						
109,486	MW-203				1119						
109,487	MW-204				1126						
109,488	F.B.				1101						
109,489	Collection Sump				1102						
109,490	SW-1				1052						
109,491	SW-2				1208						
109,492	SW-3				1210						
109,493	SS-1	SO			1052	1	8oz jar			ICE	
109,494	SS-2				1208	1					
109,495	SS-3				1210	1					
109,496	DUP-1	AQ			1158	2	40mL VOA			HCL+ICE	

Relinquished by: Signature	Received by: Signature	Date/Time 9.10.97 1515
Relinquished by: Signature	Received by: Signature	Date/Time 9.10.97 1550

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

Laboratory Services

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OCT 01 RECD

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
DATE REPORTED: September 29, 1997
DATE SAMPLED: September 10, 1997

PROJECT CODE: TSEC1291
REF. #: 109,471 - 109,483

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated proper sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

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ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 19, 1997
STATION: MW-201
REF.#: 109,471
TIME SAMPLED: 1114

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	50	TBQ[2]
Chlorobenzene	50	ND[3]
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	239.
Toluene	50	ND
Xylene	100	601.
MTBE	100	614.

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	115.%
Toluene-d8:	102.%
4-Bromofluorobenzene:	94.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 2.% dilution.
2 Trace below quantitation limit
3 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 19, 1997
STATION: MW-202
REF.#: 109,472
TIME SAMPLED: 1130

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	50	ND[2]
Chlorobenzene	50	ND
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	283.
Toluene	50	101.
Xylene	100	4,370.
MTBE	100	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	113.%
Toluene-d8:	109.%
4-Bromofluorobenzene:	97.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 2.% dilution.
2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 18, 1997
STATION: MW-203
REF.#: 109,473
TIME SAMPLED: 1119

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	3.5
Toluene	1	ND
Xylene	2	33.0
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	113.%
Toluene-d8:	100.%
4-Bromofluorobenzene:	99.%

NOTES:
1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 18, 1997
STATION: MW-204
REF.#: 109,474
TIME SAMPLED: 1126

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	5	ND[2]
Chlorobenzene	5	ND
1,2-Dichlorobenzene	5	ND
1,3-Dichlorobenzene	5	ND
1,4-Dichlorobenzene	5	ND
Ethylbenzene	5	29.6
Toluene	5	ND
Xylene	10	28.4
MTBE	10	12.0

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	113.%
Toluene-d8:	90.%
4-Bromofluorobenzene:	93.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 20.% dilution.

2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 18, 1997
STATION: F.B.
REF.#: 109,475
TIME SAMPLED: 1101

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	112.%
Toluene-d8:	101.%
4-Bromofluorobenzene:	98.%

NOTES:
1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 18, 1997
STATION: Collection Sump
REF.#: 109,476
TIME SAMPLED: 1102

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	114.%
Toluene-d8:	101.%
4-Bromofluorobenzene:	98.%

NOTES:
1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 18, 1997
STATION: SW-1
REF.#: 109,477
TIME SAMPLED: 1052

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	110.%
Toluene-d8:	102.%
4-Bromofluorobenzene:	98.%

NOTES:
1 None detected

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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 18, 1997
STATION: SW-2
REF.#: 109,478
TIME SAMPLED: 1208

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	112.%
Toluene-d8:	103.%
4-Bromofluorobenzene:	99.%

NOTES:
1 None detected

ENDYNE, INC.

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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 18, 1997
STATION: SW-3
REF.#: 109,479
TIME SAMPLED: 1210

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	113.%
Toluene-d8:	98.%
4-Bromofluorobenzene:	100.%

NOTES:
1 None detected

ENDYNE, INC.

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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 18, 1997
STATION: SS-1
REF.#: 109,480
TIME SAMPLED: 1052

Parameter	Detection Limit (ug/kg)	Concentration As Received (ug/kg)
Benzene	10	ND[1]
Chlorobenzene	10	ND
1,2-Dichlorobenzene	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
Ethylbenzene	10	ND
Toluene	10	ND
Xylene	20	ND
MTBE	20	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	118.%
Toluene-d8:	105.%
4-Bromofluorobenzene:	90.%

PERCENT SOLIDS: 65.%

NOTES:
1 None detected

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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 19, 1997
STATION: SS-2
REF.#: 109,481
TIME SAMPLED: 1208

Parameter	Detection Limit (ug/kg)	Concentration (ug/kg)
Benzene	10	ND[1]
Chlorobenzene	10	ND
1,2-Dichlorobenzene	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
Ethylbenzene	10	ND
Toluene	10	ND
Xylene	20	ND
MTBE	20	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	111.%
Toluene-d8:	103.%
4-Bromofluorobenzene:	83.%

PERCENT SOLIDS: 71.%

NOTES:
1 None detected

ENDYNE, INC.

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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 19, 1997
STATION: SS-3
REF.#: 109,482
TIME SAMPLED: 1210

Parameter	Detection Limit (ug/kg)	Concentration As Received (ug/kg)
Benzene	10	ND[1]
Chlorobenzene	10	ND
1,2-Dichlorobenzene	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
Ethylbenzene	10	ND
Toluene	10	ND
Xylene	20	ND
MTBE	20	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	107.%
Toluene-d8:	104.%
4-Bromofluorobenzene:	82.%

PERCENT SOLIDS: 70.%

NOTES:
1 None detected

ENDYNE, INC.

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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: F.A. Richmond/97-071.E1
REPORT DATE: September 29, 1997
SAMPLER: B.W./R.L.
DATE SAMPLED: September 10, 1997
DATE RECEIVED: September 10, 1997

PROJECT CODE: TSEC1291
ANALYSIS DATE: September 19, 1997
STATION: Dup-1
REF.#: 109,483
TIME SAMPLED: 1158

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	50	TBQ[2]
Chlorobenzene	50	ND[3]
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	213.
Toluene	50	ND
Xylene	100	721.
MTBE	100	652.

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	118.%
Toluene-d8:	105.%
4-Bromofluorobenzene:	99.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 2.% dilution.
2 Trace below quantition limit
3 None detected

TSEC1012

20980

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

109,471 —— 109,496

Project Name: F.A. Richmond 97-071.E1 Site Location: WOODSTOCK, VT	Reporting Address: P.O. Box 719 Richmond, VT 05477	Billing Address: SAME
Endyne Project Number: TSEC1291	Company: TSEC Contact Name/Phone #: Jon Bernstein 434-3350	Sampler Name: RW - RL Phone #: 434-3350

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
109,471	MW-201	AQ	✓		9/10/97 1114	2	40ml VOA		8021 + MTBE / Thi..., 8015	HCl + ICE	NO
109,472	MW-202	↓	↓		1130	↓	↓		↓	↓	↓
109,473	MW-203				1119						
109,474	MW-204				1126						
109,475	F.B.				1101						
109,476	Collection Sump				1102						
109,477	SW-1				1052						
109,478	SW-2				1208						
109,479	SW-3	↓			1210	↓	↓			↓	
109,480	SS-1	SO			1052	1	1 8oz jar			ICE	
109,481	SS-2	↓			1208	1	↓			↓	
109,482	SS-3	↓	↓		1210	1	↓		↓	↓	↓
109,483	DUP-1	AQ	↓		1135	2	40ml VOA			HCl + ICE	

Relinquished by: Signature [signature]	Received by: Signature [signature]	Date/Time 9.10.97 1515
Relinquished by: Signature [signature]	Received by: Signature [signature]	Date/Time 9.10.97 1550

New York State Project: Yes ____ No ✓

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										